INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2003	**Park:** Shenandoah NP
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Permit#: SHEN-2001-SCI-0002	
Park-assigned Study Id. #: SHEN-00260	
Project Title: MONITORING AND ANALYSIS OF REFERENCE SUSPENDED SEDIMENT LOAD IN AN UNDISTURBED, FORESTED, ROSGEN CLASS B CHANNEL IN SHENANDOAH NATIONAL PARK. (MEADOW RUN)	
Permit Start Date: Feb 01, 2001	**Permit Expiration Date** May 31, 2004
Study Start Date: Feb 01, 2001	**Study End Date** May 31, 2006
Study Status: Continuing	
Activity Type: Research	
Subject/Discipline: Water / Hydrology	
Objectives: To determine the actual suspended sediment load, over the range of water discharge rates, for a natural, undisturbed, forested Rosgen Class B stream reach in Shenandoah National Park.	
Findings and Status: The study is progressing well. Collection of a sufficient dataset has been slowed, however, by two unanticipated events. First, as reported last year, data collection was disrupted as monitoring equipment was vandalized. The monitoring equipment not destroyed by vandals was removed from the monitoring site. Discrete data collection in all data categories has continued at intervals of high and low water flow during periodic field visits. Installation of new monitoring equipment as anticipated last year has not yet occurred. This equipment installation is scheduled for May 2004 pending an extension of the project. Second, water flows generated by hurricane Isabel significantly changed the channel cross-section and longitudinal dimensions at the study site. Massive amounts of large stone were moved along the streambed during this event, essentially burying the channel area where monitoring equipment had been installed. (If equipment had been in place at this moment it indeed would have been lost. An attempt to visit the site and measure water discharge immediately after the hurricane was unsuccessful due to the large water flows and flooding at access points.) An extensive resurvey of channel dimension, pattern, and profile will need to be performed this summer to determine the extent of change in channel geometry post-Isabel, and how this might affect previously determined stage-discharge and sediment relationships. This event can be viewed as a significant opportunity. New channel	

measurements will allow us to characterize the magnitude of change in channel morphology caused by the storm, in addition to providing the relationships identified in the study. We simply need a bit more time to collect and analyze these measurements and data.

Analysis of collected measurements will yield the following products:

1) A suspended sediment reference rating curve, expressing suspended sediment as a function of stream water discharge for an undisturbed Rosgen Class B Stream Reach in Virginia.

(2) A dimensionless sediment reference curve, expressing suspended sediment as a function of the fraction of bankfull stream water discharge for an undisturbed Rosgen Class B Stream Reach in Virginia.

(3) A non-linear statistical model of suspended sediment load as a function of stream water turbidity for an undisturbed Rosgen Class B Stream Reach in Virginia.

(4) Dimensionless reference curves expressing the ratios of natural channel hydraulic geometry to bankfull dimension for an undisturbed Rosgen Class B Stream Reach in Virginia.

(5) Stream Bed particle size distributions, determined using the Wolman Pebble Count method, for an undisturbed Rosgen Class B Stream Reach in Virginia.

(6) Data showing stream water discharge, water level, turbidity, and suspended sediment load for an undisturbed Rosgen Class B Stream Reach in Virginia.

(7) Ancillary measurements and possible reference rating curves for stream water temperature, conductivity, dissolved oxygen, pH, and nitrate nitrogen in an undisturbed Rosgen Class B Stream Reach in Virginia.

In addition, new post-Isabel field surveys will determine any changes in channel geomorphology, capacity, and streambed particle size distribution resulting from the hurricane induced water flows.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?

No

Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**
0	5000

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college

Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0